Binomial Probability Continued

#4 from last nights homework: You take a multiple choice quiz that consists of 10 questions. Each question has four possible answers, only one of which is correct. To complete the quiz, you randomly guess the answer to each question. What is the probability that you get exactly 3 questions right? Exactly 2 questions right? Exactly 1 question right? Exactly 0 questions right? $nCx \cdot p^x \cdot q^{n-x}$

n = 10
p = 25%
x = 3, 2, 1, 0

P(Exactly 3) = .25
P(Exactly 2) = .28
P(Exactly 1) = .18
P(Exactly 0) = 0.05

How to find P(Exactly 3) on your calculator:

.25 binompdf(n, p, x) 2nd → vars → A:

What if I want to know P(at most 3)?

.776 binomcdf(n, p, x)

☆ calculate P(x), down

How do I find the P(at least 3)?

.474 1 − binomcdf(n, p, X−1)

The results of a recent survey indicate that 58% of households in the United States own a gas grill. If you randomly select 100 households, what is the probability that exactly 65 households will own a gas grill?

n = 100 **p = 58%** **x = 65**

P(exactly 65) =
binompdf(100, .58, 65) = 0.03

What is the probability that at least 65 households will own a gas grill?

1 − binomcdf(100, .58, 64) = .893

What is the probability that at most 65 households will own a gas grill?

binomcdf(100, .58, 65) = .937

Back to one of our original problems:

A certain surgical procedure has an 85% chance of success. A doctor performs the procedure on eight patients.

a.) Find P(exactly 5) binompdf(8, .85, 5) = 0.084

b.) Find P(at least 5) 1 − binomcdf(8, .85, 4) = .978

c.) Find P(less than 5) binomcdf(8, .85, 4) = .021

d.) Find P(more than 5) 1 − binomcdf(8, .85, 5) = .895

Problems from book: Page 223-224/ 29, 32, 34, 35

29. n = 10
p = 20%
x = 0, 1

a. binompdf(10, .2, 0) = 10.7%

b. 1 − binomcdf(10, .2, 0) = 89.2%

c. binomcdf(10, .2, 1) = 37.6%

d. NO

32. n = 10
p = 94%
x = 9, 7

a. 1 − binomcdf(10, .94, 8) = 88.2%

b binompdf(10, .94, 7) = 1.7% yes

34. n = 5
p = .05%
x = 2

a. binompdf(5, .0005, 2) = 0.00025%

b. 1 − binomcdf(5, .0005, 1) = 0.00025%

c. NO, % is lower than 5

35. n = 20
p = 10%
x = 2

binomcdf(20, .1, 2) = 67.8%

yes

Source: http://rchsbowman.wordpress.com/2008/11/21/statistics-notes-binomial-probability-experiment/